

HEEP

S.H.E. LTD. HARDWARE

PURCHASE SPECIFICATION

ADHESIVE -88

FORM 0504.803.

BASED ON TYMX-1542-49.

REVISION

SHEET NO. 1

TOTAL SHEETS 6

CPL/2.81

ORDERING SPECIFICATION1. GENERAL

This specification governs the quality of liquid cold setting type Adhesive used for bonding rubber to metals, glass and other surfaces as well as rubber with rubber. The adhesive will be ^{of} brush application consistency.

2. COMPOSITION

The adhesive is a solution of a rubber composition and butyl-phenol-formoldehyde resin in a Hydrocarbon solvent other composition having comparable/superior properties will be acceptable.

3. PROPERTIES

3.1 COLOUR: The adhesive will be homogenous in colour and consistency without any foreign matter or clots.

3.2 SOLID CONTENT: The concentration of adhesive shall not be less than 30 $\pm$ 2%.

3.3. Mechanical properties of adhesive joints

3.3.1 In shear(lap joint)

The mechanical strength of the joint between rubber and Mild steel or rubber and duralium made under the optimum conditions will not be less than 2 kg/cm² when measured with the elapse of 24 hours and 48 hours respectively after joining.

3.3.2 In Tension(Butt joint)

The mechanical strength of the joint between rubber and mild steel or rubber and duralium when made under the optimum conditions will not be less than 11 kg/cm² and

WORKED BY.	T.D. GERA	APPROVED	IN FORCE FROM	2-7-73	Rev. 01			
CHECKED BY.	O.P. CHANDRA							
SUPERVISED.	O.P. CHANDRA							
STD CONTROL.	APPROVED SIGNATURE							

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SIZE 11

INVENTORY NO. P-1167
SIGN & DATE 20.8.73
SUPERSEDES INVENTORY NO.
DUPLICATE INVENTORY NO.
SIGN & DATE
COORDINATING DEPT.
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13 kg/cm² when measured with the elapse of 24 hours and 48 hours respectively after joining.

4. TEST METHODS

- ②.1 Colour of the adhesive and absence of extraneous substances and the undissolved clots is examined visually by taking a sample on a flat surface.

4.2 Concentration

Concentration of the adhesive is established by determining the solid content. 2-3 grams of the adhesive is taken in a special metallic container. The metallic container is closed with cover and the weight is taken to an accuracy of 0.002 gm. Then the cover is removed and the container put in a furnace at a temp. of 90° - 100°C so as to evaporate the solvent. The adhesive is dried to a constant weight and then the percentage of the solid content is determined. The arithmetic mean of two samples is taken as the percentage of the solid content.

4.3 Mechanical properties of adhesive joints

4.3.1 In shear

For determining the strength of the adhesive joints in shear, mild steel or duralium strips 150-180x25mm and 1-3mm thick are joined with rubber strips 150-200 x 25mm and 3+0.3mm thick in an overlap of 10mm/12.5mm.

Unless otherwise prescribed by the manufacturer of the adhesive, the joint will be deemed to have been prepared in optimum way by the following method:-

The surfaces to be joined are roughened by emery paper. The roughened surfaces are cleaned twice by means of cotton rag dipped ~~in~~ in benzene. The adhesive is thoroughly mixed and a thin layer of adhesive is applied to the metallic surface by means of brush and is dried for 3-4 minutes

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at room temperature. Subsequently a second layer of adhesive is applied on the metallic strip and at the same time a similar layer is applied to the rubber surface. The drying of the second layer is continued at room temperature for 5-6 minutes till the adhesive film becomes sticky.

After drying the steel/duralium and rubber surfaces are joined and rubber is thoroughly pressed to the metallic surface by means of a metallic roller weighing 500-900gms. which is rolled on the joint tens of times. After rolling the surfaces to be joined by means of the roller, the joint is placed under load with intensity not less than 2 kg/cm^2 . The joint strength is determined with the lapse of 24 hours on a tensile testing machine, speed of travel of the lower clamp of the machine being 100mm/sec. 5-6 readings are taken. Arithmetic mean of these readings divided by the width of the joint expressed in kg/cm. is stated as joint strength in shear.

4.3.2 In Tensile

For determining the strength of the adhesive joint in tension mild steel/duralium discs of shape and size as indicated in the figure are joined with rubber disc of diameter 25mm and thickness 3 ± 0.3 mm. The surface of the steel/duralium discs and that of the rubber is roughened as described in 4.3.1. The working surface of the discs must have Δ_3 finish (arithmetic mean deviation of surface finish shall be 40 microns).

Application of the adhesive to the disc and rubber and its drying is carried out as detailed in 4.3.1 First of all one disc is joined with rubber. After joining, the uncoated rubber surface on the disc is pressed manually for a few seconds towards the clean surface of the other disc. Then

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the disc is joined with the second disc. The joint strength is determined with the lapse of specified time after joining on a tensile testing machine, the speed of travel of the lower clamp of machine being 100mm/sec. load (Arithmetic mean of atleast three readings) required to separate the discs divided by the area of joint expressed in kg/cm^2 is stated as the joint strength in tension.

5.00 SAMPLE FOR TESTING

The supplier shall furnish two samples of adhesive 250ml. each and the corresponding thinner in air tight containers at the time of enquiry and shall state the pretreatment/ methods for bonding the surfaces by means of adhesive and the thinner for optimum joint strength. The containers shall be labelled with the following information:-

- a) Sample
- b) Enquiry No.
- c) Description of material, its grade and the present specification No.
- d) The quantity of the sample.
- e) No. of batch and date of manufacture.
- f) Name of supplier.
- g) Information regarding composition as per clause 2.

6 PACKING AND MARKING:

- 6.1 The adhesive shall be supplied in air tight containers. Size of the container shall be indicated in order.
- 6.2 The consignment shall meet the prevalent regulations regarding the despatch of the inflammable materials.
- 6.3 Each container shall have the following information marked on it with the indelible ink.

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					STD. CONTR.	PSING	82	2/11/73	CHG.	NOS.	DOCU NO.	SIGN	DATE	CHG.

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- a) Name and address of the supplier.
- b) Purchase Order No.
- c) Description of the material.
- d) Present specification No.
- e) Quantity of adhesive.
- f) No. of batch and date of manufacture.
- g) Net and gross weight in kg.
- h) Test certificate and.
- i) Date of expiry of shelf life.

7. STORAGE CONDITIONS AND SHELF LIFE.

The shelf life of the adhesive shall not be less than 3 months when stored in a closed container at a temperature of $25 \pm 5^\circ \text{C}$ and relative humidity not exceeding 70 percent from the date of receipt of material at B.H.E.L. Hardwar. However supplier will indicate the shelf life of the adhesive.

8. INSPECTION AND CERTIFICATE OF GUARANTEES.

Normally, on each consignment, the supplier shall furnish a certificate to the effect that the material conforms to the requirements of the present specification in respect of the composition and a guarantee certificate shall be furnished in respect of the shelf life of the material. However, all the facilities shall be afforded to the BHEL on its request to satisfy itself regarding the chemical nature of the adhesive at manufacturer works.

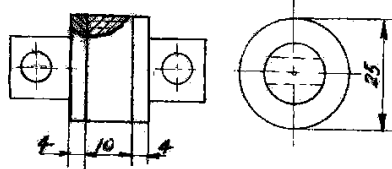


FIG. 1

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